

show plain traces of descent from ancestors who in some way shared the higher culture of Asiatic nations. At Wellington Prof. Bastian found Mr. John White, who, as a skilled translator of Maori, worked for Sir George Grey in bringing out the "Polynesian Mythology," and has been engaged in the study of native lore ever since. He is about to publish the results of his long study with the aid of the Colonial Government, and we have here as a specimen one of those mystic Maori cosmogonies which make us fancy we are hearing some Buddhist or Gnostic philosopher pour out his dreamy metaphysics about the origin of things. Out of the Primal Night, says the Maori poet, there divided itself Nothing, then came Darkness, then Seeking, and Following, and then such stages as Conception of Thought, Spirit Life, Desire, Coming into Form, Breath of Life, Space. All this is of a piece with the native Polynesian poetry in Taylor's "New Zealand," and that lately published by Judge Fornander in Hawaii. The poem that begins with the time when there was no voice nor sound, no day nor night, may remind us of the famous hymn of the Rig Veda that begins "Nor aught nor naught existed." We find here the well-known chant of Taaroa, how in the emptiness of space, when there was no earth nor sky nor sea, Taaroa passing into new forms became the foundation of the rocks and the sand of the sea, and the land of Hawaii was born as his shell. Prof. Bastian well compares this with the Scandinavian poem in the Edda, how there was no sand nor sea nor salt waves, no earth nor sky above, till Bör's sons made the mighty Midgard—earth. He points out, as he has already done, the curious likeness between the Scandinavian story of the fishing up of the monstrous Midgard-snake; and the South Sea Island tale of Maui fishing up the island of New Zealand. Not less striking is such an analogy as the Polynesian Taaroa mating with his own energy in female form, like a Hindu god with his Sakti. The author may well ask, are these people, with such far echoes of Orphic, Chaldean, Buddhist philosophy, the simple playful children of nature on whom we look down as representing the lowest rungs in the ladder of development? In Hawaii the German anthropologist learnt much from King Kalakaua, who is thoroughly initiated in the religious ideas of his royal predecessors, who used to have the eyes of their enemies offered them by the high priest in the stone bowl which his majesty still keeps as a curiosity. Out of the royal library he produced a MS. temple-chant, written about the beginning of this century, containing a cosmogony, of which Prof. Bastian reproduces as much as he had time to have translated. It has real poetry in it, and as a piece of child-like philosophy it is not without interest in its enumeration of the orders of beings, the grubs and worms, the sea-eggs and mussels, the seaweed in the ocean watched by the grass on land, the cranes and the gulls at sea watched by the hawks on land, and so on with trees and other creatures, till at last the gods come into being, and man rises out of the night. For a specimen of barbaric science may be mentioned the Maori myth told to the author by Mr. Davis, how the Moon arose out of the ocean, and still keeps the traces of this marine origin in its phases, which follow the ebb and flow of the tide.

EDWARD B. TYLOR

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

The Struggle of Parts in the Organism

ALTHOUGH I agree with the Duke of Argyll that the pages of NATURE are not adapted to a discussion on the general question of Theism, the letters which you this week publish leave me no alternative but that of entering upon the subject, so far at least as it seems desirable that I should now express my individual opinion on the points which your correspondents have raised.

My statement of what I conceive to be the position of the matter may best be rendered by answering first the questions which are put to me by Dr. Carpenter. He desires me to explain the "precise sense" which I attach to the phrase, "a general law whose operation is presumably competent to produce any set of phenomena," and proceeds in a most terse and lucid manner to expound the well-known and unquestionable truth that "in the purely scientific sense a 'law of nature' is nothing more than a general expression of a certain set of uniformities which the intellect of man discerns in the surrounding universe," &c. This is the only sense in which I have intended to use the term, and if my meaning has been obscured by speaking of a general law "producing" any set of phenomena, it is only because the idea of "a law of nature" as "any kind of coercive agency," or indeed anything other than "a generalised expression of facts," was so far from my mind that I perhaps too readily employed a convenient, though metaphorical,¹ mode of expression—just as one speaks of the sun rising, &c. In speaking then of Natural Selection as "competent to produce" certain phenomena I only meant that, given a certain set of activities and conditions supposed to be uniform, and the phenomena in question would occur, whether or not these activities and conditions are taken to be due to a disposing mind. So far, therefore, am I from maintaining "that there is anything in the law of Natural Selection that places it in a different category from every other," that my whole contention is exactly the reverse—namely, that the law of natural selection stands to certain observed phenomena of biology in just the same logical relation as, for instance, the law of gravitation stands to certain observed phenomena of astronomy. Indeed, it is just because I hold the laws of evolution to be so precisely identical in logical status with all other so-called laws of nature, that I see no better evidence of Design in "the adapted structures" of "the Human Hand" than I do in the adaptation, say, of a river to the bed which it has itself been the means of excavating.² In both cases I believe that physical causes have been at work (whether or not there have been metaphysical causes of a mental nature behind them), with the difference only that the one set are more complex and less obvious than the other. But in each case alike, if the physical causes are deemed adequate to furnish a scientific explanation of the effects, there is no residual effect to be carried over for explanation by any metaphysical theory of Design. Design, of course, there may be in both cases; I only maintain that if the laws of evolution are conceded to stand to the structure of an organism in the same logical relation as certain other natural laws stand to the structure of a river's bed, then, *ex hypothesi*, the one set of adaptations constitutes no evidence of Design different in kind from that furnished by the other.

This appears to be the point where my opinion has had the misfortune to be found at variance with that of the Duke of Argyll. For in his last letter he says that "there are in nature a few [?] many, *vide infra*] cases of apparent adaptations and of

¹ *I.e.* "metaphorical" as investing a natural "law" with the signification of a natural "cause." A law of nature I take to mean a general proposition or formula which expresses the observed operation of certain physical causes, whether or not these are known. Therefore, although it is, strictly speaking, incorrect to say that "natural selection is a law competent to produce adaptations," in using such a form of expression one may be understood to mean "the sundry physical causes, whose joint operation is formulated by the law of natural selection, are competent to produce," &c.

² This illustration is borrowed from Mr. Wallace, who, in his "Natural Selection," elaborates it very instructively.

orderly arrangements of a very simple kind which do not necessarily suggest Mental Purpose. They may be the effect of what we call accident, or of the action of elementary laws under no guidance or direction. Inorganic phenomena furnish many examples of such arrangements," &c., the argument proceeding to the conclusion that "the writers of the last generation were perfectly right in resting the general Argument from Design on the separate instances of adaptation in which the mark of Mind is most signal and conspicuous"—i.e. in organic structures. Now until it is shown wherein we are justified in classifying natural laws under two such categories as "elementary laws under no guidance or direction," and laws whose "action" gives rise to "separate pieces of evidence pointing to the operations of special design"—until this is shown I must remain of the opinion that "Mr. Darwin's theory of Natural Selection" does "touch this argument" of scientific teleology. The distinction between two such sets of general laws is clearly not one that can be recognised by science, and if it is conceded that the theory of Natural Selection is competent to explain the proximate or physical causation of "structural adaptations," we have no more right to refer the latter to ultimate or metaphysical causes than we have so to refer "orderly arrangements of a very simple kind which do not necessarily suggest Mental Purpose." For if this concession is made it means that the one set of causes differs from the other only, as I have said, in being somewhat more complex in character and less obvious in operation.

Again, the Duke of Argyll says he is "not able to accept" the distinction which I drew between scientific and metaphysical teleology. The distinction nevertheless remains, and it seems to me so obvious that I must suppose the Duke has in some way failed to appreciate my meaning. However he says, "The fundamental proposition of all arguments from Design is simply this: that the exquisite adaptations to special ends which are conspicuous in organic nature are, and can only be, the work of physical forces when these are under the combination and direction and control of Mind." But this is not "the teaching of the great masters" whom Dr. Carpenter names in his letter.¹ To some of them, at any rate, such a needless restriction of the argument to special adaptations in "organic nature" seemed unwarrantable, and since Mr. Darwin has shown how these special adaptations may be proximately explained by the operation of certain physical causes, the tide of theistic opinion has more than ever turned towards a still more "fundamental proposition" of the argument from Design, viz. that the harmonious uniformity of Nature as a whole demands some one co-ordinating principle as its explanation. And when from this proposition it is argued that the principle in question must be of a psychical character, the argument belongs to the province of what I have called metaphysical teleology. This, indeed, is merely the "Cosmo-theology" of Baden-Powell, who saw very clearly the distinction which I have endeavoured to present, and while inveighing more heartily than I have done against "the narrow and unworthy form in which the reasoning has been too often conducted," maintained that the "fundamental proposition," "the very essence of the whole argument, is the invariable preservation of the principle of order," &c.

Lastly, I do not understand the Duke where he says that I am much mistaken if I "suppose that the present generation is satisfied with the purely materialistic explanations of adapted structures which are erroneously supposed to be the final result of Mr. Darwin's theory." I have not said anything to imply that I supposed these explanations to be "purely materialistic." As a matter of individual opinion I do not think that in themselves they are. I see plainly enough that they have reduced the "exquisite adaptations conspicuous in organic nature" to the same general category of physical causation as all other phenomena in the physical universe; but for this very reason, if for no other, I should fail to see that they can be "purely materialistic" in the sense of touching the transcendental or extra-scientific question of Theism.

Having thus stated my views at some length, I shall take no further part in this correspondence, unless it should appear that some further explanation is desirable.

GEORGE J. ROMANES

¹ Except, perhaps, Mill, who thought highly of this form of teleology. But he also thought that if Mr. Darwin's "remarkable speculation" should be established as a truth of science, it would seriously "touch" the argument, as showing that "creative forethought" is not absolutely the only link by which the origin of the wonderful mechanism of the eye may be connected with the fact of sight," &c.

Prof. Stokes's Lectures on Solar Physics

THE subject of these lectures (NATURE, vol. xxiv. pp. 593, 613) related primarily to the sun, and I was concerned with certain magnetic or electrical phenomena which are observed at the earth's surface only in so far as they related to the elucidation of the physics of the sun. Accordingly these collateral subjects were treated only very briefly, and I did not attempt to give anything like a history of the discoveries which have been made in them, even as regards the portions which bear more immediately on the physics of the sun. Indeed in many cases I designedly refrained from mentioning names, lest the hearers should suppose that I was giving a history of the subject, and those whose names might not appear in the very imperfect notice which it would have been should feel aggrieved. When a phenomenon was well known I generally contented myself with referring to it as such. Thus, for example, in alluding to earth-currents I spoke of them as what the progress of telegraphy had made us "familiarly acquainted with"; I said nothing about their discovery by Mr. Barlow, as described in his important paper published in the *Philosophical Transactions* for 1849, though it was a paper I had studied in connection with the lectures. I hope this example may suffice to prevent any one whose name does not appear from feeling annoyed at the omission, and to prevent the readers of NATURE from taking my lectures for what they were not intended to be, namely, a complete history of the subject. I take this opportunity of referring to one passage in my second lecture (NATURE, p. 415, a little above the figure), where I say "we might not have tension enough to produce such a discharge [i.e. a flash of lightning], the resistance to the passage of electricity from one portion of the air to another, which at any rate would be comparatively dry compared with what we have in warm latitudes, would prevent it by itself alone." These words, without actually asserting, seem to imply that the resistance to such a discharge through moist air would be less than through dry. My attention has been called by a friend to the fact that it has been found by experiment that moist air insulates as well as dry. I have not met with experiments tending to show whether the resistance to a disruptive discharge is the same or not in the two. Be that as it may, it does not affect what follows; for we know as a fact that thunderstorms are absent in high latitudes.

Cambridge, November 8

G. G. STOKES

The Society of Arts Patent Bill

IT appears that "the draft of a Bill for the Amendment of the Patent Laws has been prepared by a committee of the Society of Arts, and is published by the Council of that Society for consideration."

From the printed bill so prepared and published the following extracts are made:—

Extract from the Proposed Patents for Inventions Bill.

Section 3. "An invention is deemed new for the purposes of this act if it has not been published or publicly used in the United Kingdom, the Channel Islands, or the Isle of Man within the thirty years immediately preceding the date of the application of a patent for it.

"5. A patent may be granted under this act for:—

"(a) Any manufacture or any product not being a natural product;

"(b) Any machine, or any means of producing any manufacture, product, or result;

"(c) Any process or method of producing any manufacture, product, or result;

"(d) Any part of a machine, means, process, or method of producing any manufacture, product, or result.

8. Commissioners of Patents and Examiners.

"(1) There shall be a Board of Commissioners of Patents for Inventions, in this act referred to as the commissioners:—

"(2) At any time after the passing of this act Her Majesty may, by warrant under the Sign Manual, appoint three persons to be commissioners, of whom one shall be experienced in engineering, one shall be experienced in chemistry, and one shall be experienced in the law.

"9.—(1) The commissioners may from time to time after the passing of this act, subject to the approval of the Treasury, appoint such persons qualified by knowledge of manufactures or science or arts, as they see fit, to be Examiners of Patents.